

2018 POTATO VARIETY TRIALS

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Introduction

New potato varieties were evaluated in 2018 for their productivity and their suitability for fresh market and processing. Potatoes in Malheur County, Oregon, are grown under contract for processors to make frozen potato products for the food service industry and grocery chain stores. There is very little production for fresh pack or open market, and very few growers store potatoes on their farms. There is also no local production of varieties for making potato chips.

The varieties grown for processing in Malheur County are mainly ‘Ranger Russet’, ‘Shepody’, and ‘Russet Burbank’. Harvest begins in July and potatoes arrive at processing plants for storage or processing directly from the field.

Prolonged vine health supports increased potato yield, but the “early die” syndrome can limit tuber bulking later than mid-August. Early die causes early senescence of the vines of susceptible varieties such as Shepody and Russet Burbank. A complex of soil pathogens, including bacteria, nematodes, and fungi, particularly *Verticillium* wilt, causes early die in Malheur County. Early die is worse when the crop rotation between potato crops is shorter.

Small acreages of new varieties or advanced selections are sometimes grown under contract to study the feasibility of expanding their use. To replace an existing processing variety, a new potato variety must have numerous outstanding characteristics. The yield should be at least as high as the yield of the currently contracted varieties. The tubers need to have low reducing sugars for light fry color, and high specific gravity. A new variety should be resistant to tuber defects or deformities caused by disease, water stress, or heat. It should begin tuber bulking early and grow rapidly for early harvest. Late-harvested varieties resistant to early die can continue bulking into September.

Potato variety development trials at the Malheur Experiment Station in 2018 included the Tristate Russet Trial with 14 entries, the Oregon Statewide Russet Trial with 31 entries, the Preliminary Yield Russet Trial with 123 entries, the National Fry Processing Trial (NFPT) with 44 entries, the Oregon Statewide Specialty Trial of 6 colored skin and/or flesh potato varieties, the Western Region Specialty Trial of 13 colored skin and/or flesh potato varieties, the Preliminary Yield Specialty Trial of 24 colored skin and/or flesh potato varieties, the Oregon Statewide Chip Trial with 10 entries, and the Preliminary Yield Chip Trial with 33 entries. Through these trials and active cooperation with other scientists in Oregon, Idaho, and

Washington, promising new lines are bred and evaluated. Eventually, the lines may be released as new varieties.

Materials and Methods

The potato variety trials were grown in 2018 on Greenleaf silt loam, following winter wheat using sprinkler irrigation. Based on a soil test, 15 lb phosphorus (P)/acre, 85 lb potassium (K)/acre, 160 lb sulfur (S)/acre, 9 lb manganese (Mn)/acre, 1 lb copper (Cu)/acre, and 4 lb boron (B)/acre were broadcast in the fall of 2017. The field was fumigated with 20 gal/acre of Telone[®] II and bedded on 36-inch row spacing in the fall of 2017. On April 2, 2018, 100 lb nitrogen (N)/acre and 20 oz/acre of Admire[®] (Imidacloprid) at 7 oz/acre (0.25 lb ai/acre) were shanked in the bed center.

Seed of all varieties was cut by hand into 2.5-oz seed pieces, treated with Maxim[®] MZ (fludioxonil, mancozeb) dust, and stored briefly to suberize. Potato seed pieces were planted using a 2-row assist-feed planter with 9-inch seed spacing in 36-inch rows. Red potatoes were planted at the end of each plot as markers to separate the potato plots at harvest, except in the specialty trials where russeted potatoes were used as markers.

The TriState Russet Early Trial was planted on April 3. The State Russet Trial was planted on April 6. The Russet Preliminary Yield Trial was planted on April 10. The Regional Specialty Trial and the NFPT trial were planted on April 11. The Chip Preliminary Yield Trial was planted on April 12. The State Specialty Trial, State Chip Trial, and the Specialty Preliminary Yield Trial were planted on April 13.

All trials, except the preliminary yield trials and the NFPT trial, had plots that were a single bed wide with 30 seed pieces (23 ft long) replicated 4 times. The preliminary yield trials had unreplicated plots that were two beds with 20 seed pieces (15 ft long). The NFPT trial had plots that were a single bed wide with 15 seed pieces (11 ft long) replicated once for tier one clones, twice for tier two clones, and 3 times for tier three clones.

After planting, hills were re-formed over the rows with a Lilliston rolling cultivator. The herbicides Prowl[®] H₂O (pendimethalin) at 0.95 lb ai/acre, Dual Magnum[®] (metolachlor) at 1.27 lb ai/acre, and Roundup[®] at 2 pt/acre were applied as a tank mix for weed control on April 24. The herbicides were incorporated by sprinkler irrigation with approximately 0.5 inch of water. The herbicide Shadow[®] (clethodim) at 10 oz/acre was broadcast on May 15. Matrix[®] (rimsulfuron) at 0.25 oz ai/acre was applied on May 21 through the sprinkler system. On June 12 and June 27, Bravo[®] (chlorothalonil) at 1 pt/acre (0.75 lb ai/acre) was broadcast aerially. On July 28 and August 20, Movento[®] (Spirotetramat) at 5 oz/acre and Agri-Mek[®] (abamectin) at 3.5 oz/acre were broadcast aerially. On August 27, Zing![®] fungicide (Zoxamide, chlorothalonil) at 34 oz/acre was broadcast aerially.

Emergence for the Tristate Russet trial started on May 5. Emergence for the other trials started on May 7. Irrigation scheduling was based on a soil water tension criterion of 50-60 cb. Soil water tension was measured at seed piece depth (8-inch depth) using 8 Watermark soil moisture sensors (Model 200SS, Irrrometer Co., Inc., Riverside, CA) connected to a datalogger. Irrigations were managed to maintain the soil water tension below 60 cb. Irrigation decisions were based on the average of all 8 sensors. Irrigations started on May 21 and ended on September 6, totaling 19 irrigations.

Fertilization during plant growth was based on petiole and soil solution tests taken on June 8, June 22, June 29, July 9, July 23, August 3, and August 10. Based on the tissue and soil tests, a total of 15 lb N/acre, 75 lb K/acre, 14 lb magnesium (Mg)/acre and 0.5 lb Mn/acre were applied during the growing season. Fertilizer was injected into the sprinkler system during irrigation.

The vines in the Tristate Russet trial were flailed on August 8 and on August 14 the potatoes were harvested. For the other trials, the vines were flailed on September 14. The harvest dates for the other trials were September 24 for the NFPT trial, September 25 for the Preliminary Yield Russet trial, September 26 for the Preliminary Yield Chip and Preliminary Yield Specialty trials, September 27 for the Regional Specialty trial, October 1 for the State Russet and State Specialty trials, and October 2 for the State Chip trial.

At harvest, potatoes in each plot were lifted with a two-row digger that laid the tubers back onto the soil in each row. At harvest, visual evaluations were made that included observations of desirable traits (i.e., high yield of large, smooth, uniformly shaped and sized, oblong to long, attractively russeted tubers, with shallow eyes evenly distributed over the tuber length). Observations were also taken of the external tuber defects including growth cracks, knobs, thumbnail cracks, curved or irregularly shaped tubers, pointed ends, stem-end decay, attached stolons, heat sprouts, chain tubers, folded bud ends, scab, rough skin due to excessive russeting, and pigmented eyes. A note was made for each plot to keep or discard the clone based on the overall appearance of the tubers.

Tubers were placed into burlap sacks and placed in a barn where they were kept under tarps until grading. Tubers were graded by market class (U.S. No. 1 and U.S. No. 2) and weight (<4 oz, 4-6 oz, 6-12 oz, and >12 oz). Tubers were graded as U.S. No. 2 if any of the following conditions occurred: growth cracks, bottleneck shape, abnormally curved shape, or two or more knobs. Marketable tubers are U.S. No. 1 and U.S. No. 2 larger than 4 oz. A 20-tuber sample from each plot was placed into storage. The storage temperature was gradually reduced to 45°F.

After 6 weeks in storage, a 10-tuber sample from each plot of the Tristate Russet Trial, Oregon Statewide Russet Trial, the Preliminary Yield Russet Trial, the Oregon Statewide Chip Trial, and the Preliminary Yield Chip Trial was evaluated for tuber quality traits for processing. Ten tubers per plot of the Tristate Russet Trial, Oregon Statewide Russet trial, and the Preliminary Yield Russet Trial were cut lengthwise and the 10 center slices were fried for 2.5 min in 375°F soybean oil. For the Oregon Statewide Chip Trial, 10 tubers per plot were cut into 0.06-inch slices and fried for 2.5 min in 375°F soybean oil. Percent light reflectance was measured on the stem and bud ends of each slice for the russet varieties and in the slice center for the chip varieties. Percent light reflectance was measured using a Photovolt Reflectance Meter model 577A (Photovolt Instruments, Inc., Minneapolis, MN), with a green tristimulus filter, calibrated to read 0% light reflectance on the black standard cup and 77.1% light reflectance on the white porcelain standard plate. Specific gravity of all varieties was measured from a 10-tuber sample from each plot using the weight-in-air, weight-in-water method. All varieties were evaluated for internal tuber defects from a 10-tuber sample from each plot.

Data from all trials were analyzed with the General Linear Models analysis of variance procedure in NCSS (Number Cruncher Statistical Systems, Kaysville, UT). Means comparisons were made using Fisher's protected LSD (least significant difference) at the 95% confidence level.

Results and Discussion

In 2018, the potatoes were planted close to the ideal planting date of April 7. Irrigations were adequate to maintain the soil water tension below the critical level of 50 to 60 cb (Fig. 1). Both petiole nitrate and soil solution N levels remained above the critical level during the season, despite the low amount of N applied (100 lb N/acre preplant plus 15 lb N/acre sprinkler applied, Figs. 2 and 3). The adequate N supply to the crop is reflected in the ample amounts of soil available N during the season (Fig. 4).

Tristate Russet Trial

The clones Ranger Russet, OR12133-10, A07705-4, POR12NCK50-1, and AOR08540-1 were among those with the highest total yields (Table 1). The clones Ranger Russet, POR12NCK50-1, OR12133-10, A07547-4adg, and AOR10204-3 were among the clones with the highest U.S. No. 1 yields.

A08510-1LB, AOR08540-1, and POR12NCK50-1 were among the clones with the highest specific gravity (measure of tuber solids) in this trial (Table 1). The tuber internal defects encountered were internal brown spot and black spot bruise (Table 2). Observations on visual appearance at harvest can be found in Table 3.

Oregon Statewide Russet Trial

The clones AOR10633-1, AOR12347-5, AOR11847-2, AOR12344-21, and AOR13066-1 were among those with the highest total yields (Table 4). AOR12347-5, AOR12344-21, AOR10633-1, AOR13066-1, and AOR12386-5 were among the clones with the highest U.S. No. 1 yields.

AOR13064-2, AOR12344-21, AOR12342-2, AOR13066-1, and AOR11217-3 were among the clones with the lightest tuber fry color in this trial (Table 4). The tuber internal defects encountered for each clone are listed in Table 5. Observations on visual appearance at harvest can be found in Table 6.

Preliminary Yield Russet Trial

Some of the varieties had significantly higher yield and grade and better processing quality than the three commercial varieties in the trial (Table 7). Of the 123 clones tested, 40 were selected for further testing based on visual observations at harvest (Table 8). Some of the clones had better visual appearance at harvest than ‘Russet Norkotah’, Ranger Russet, and Russet Burbank. Tuber internal defects for the clones are listed in Table 9.

National Fry Processing Trial (NFPT)

Some varieties had higher yield and processing quality than the commercial varieties (Tables 10 and 11). Of the six commercial varieties in the trial, Ranger Russet, ‘Clearwater Russet’, and ‘Dakota Russet’ were among the highest in total yield (Table 11).

Colored Flesh Potato Trials

Potato tubers with red to yellow carotenoid or red, blue, and purple anthocyanin pigments are of interest because of the anti-oxidant properties of these pigments in human nutrition. Three trials tested specialty potato varieties in 2018: Oregon Statewide Specialty, Preliminary Yield Specialty, and Western Region Specialty.

Oregon Statewide Specialty Trial

The clones ‘Chieftain’ and POR15PG014-8 were among those with the highest total yield (Table 12). Chieftain and ‘Yukon Gold’ had the highest yield of tubers over 14 oz, an undesirable trait. POR15PG014-8 and POR15PG034-1 had the highest yield of tubers under 4 oz. POR15PG015-3 and POR15PG036-3 had the highest yield of cull tubers, due to sprouting. Tuber internal defects for the clones are listed in Table 13. Chieftain had the highest percentage of tubers with internal brown spot. Observations on visual appearance at harvest can be found in Table 14.

Preliminary Yield Specialty Trial

The varieties Yukon Gold, Chieftain, OR13SP198-2, and OR13SP198-4 were among those with the highest yield of tubers over 14 oz (Table 15). ‘Purple Majesty’, POR16PG7-3, and OR14H004-3 had high yields of cull tubers due to sprouting at harvest (Table 15). Yukon Gold Chieftain, and POR16PG42-4 had internal brown spot (Table 16). Clones POR16PG42-4 and OR13SP198-4 has vascular discoloration and hollow heart. Exterior appearance observations can be found in Table 17.

Western Region Specialty Trial

The varieties ‘Red LaSoda’ and Chieftain were among those with the highest total yield (Table 18). Red LaSoda had the highest yield of tubers over 14 oz, an undesirable trait. Clones COTX04193S-2R/Y and CO08037-2P were among those with the highest yield of tubers under 4 oz. Clones CO09128-3W/Y and CO09128-5W/Y had high yields of cull tubers due to sprouting at harvest.

Chieftain had the highest percentage of tubers with the internal defect internal brown spot (Table 19). Exterior appearance observations can be found in Table 20.

Oregon Statewide Chip Trial

Several varieties had total yields over 700 cwt/acre, with clone AOR12197-4 among the highest yielding (Table 21). Several varieties had yield of tubers over 10 oz (an undesirable trait) greater than 200 cwt/acre. Clone AOR13125-9 and ‘Atlantic’ were among those with the highest specific gravity. Tuber internal defects for the clones are listed in Table 22.

Preliminary Yield Chip Trial

Clones ‘Snowden’ and NYORQ2-10 were among those with the highest total yield (Table 23). Clones NYORQ2-10, Snowden, and NYORQ6-3 were among those with the highest yield of tubers more than 10 oz. Clones NYORQ6-6 and NYORQ6-8 were among the clones with the lightest fry color. Tuber internal defects for the clones are listed in Table 24. Exterior appearance observations can be found in Table 25.

Acknowledgements

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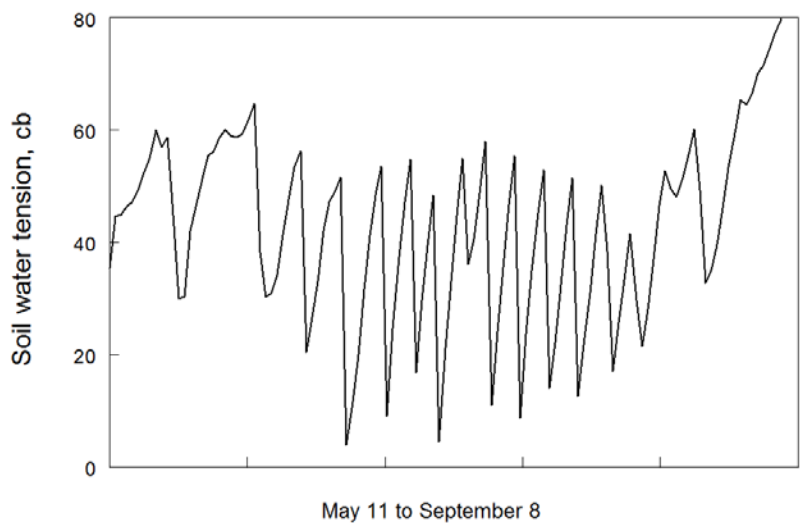


Figure 1. Soil water tension at 8-inch depth over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

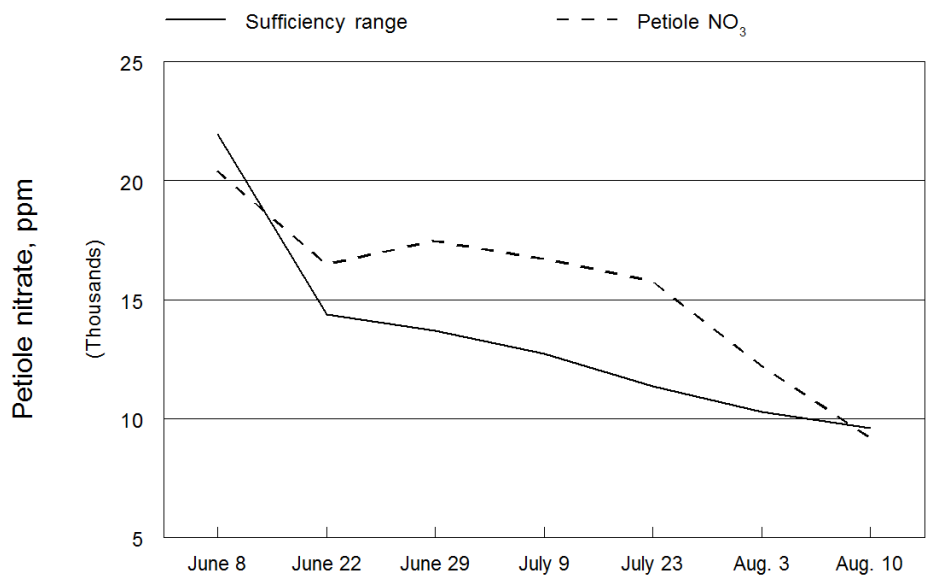


Figure 2. Petiole nitrate over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

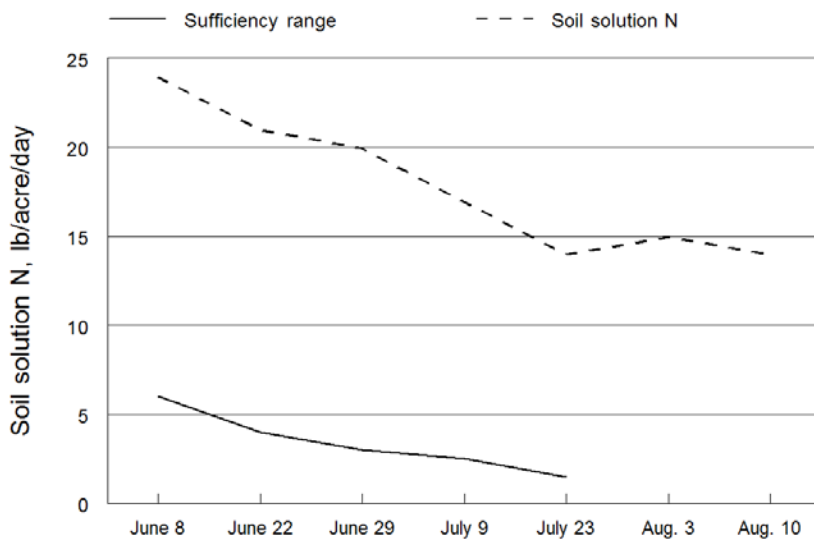


Figure 3. Soil solution nitrogen over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

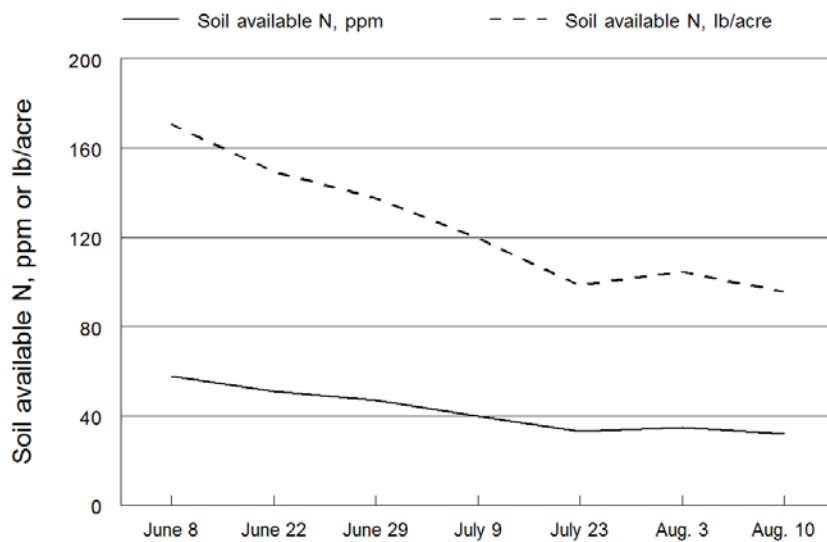


Figure 4. Soil available N ($\text{NO}_3\text{-N} + \text{NH}_4\text{-N}$) in parts per million and lb/acre over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

Table 1. Tristate Russet Trial potato yield, grade, and processing quality, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Percent No. 1 % | U.S. No. 1 Total yield | | | | | | U.S. No. 2 | Marketable | <4 oz | Cull | Average tuber weight oz | No. of tubers /plant | Length/width ratio | Specific gravity g cm ⁻³ | Average fry color, light reflectance % | Sugar ends |
|-----------------|-----------------------|---------------------------|-----------|----------------|---------------|--------------|---------------|---------------|------------|-------|------|----------------------------------|----------------------------|-----------------------|---|---|---------------|
| | | Total | >20 oz | 10 to 20 oz | 6 to 10 oz | 4 to 6 oz | U.S. No. 2 | | | | | | | | | | |
| Ranger Russet | 79.0 | 727.0 | 574.6 | 10.9 | 319.7 | 186.1 | 57.8 | 76.0 | 650.6 | 45.4 | 31.0 | 7.0 | 8.7 | 2.2 | 1.079 | 40.9 | 0.0 |
| Russet Burbank | 43.7 | 624.8 | 273.0 | 2.3 | 101.2 | 118.9 | 50.6 | 217.8 | 490.8 | 51.7 | 82.3 | 5.9 | 8.8 | 2.1 | 1.072 | 34.6 | 10.0 |
| Russet Norkotah | 80.5 | 539.4 | 434.1 | 17.1 | 167.5 | 183.4 | 66.0 | 24.5 | 458.6 | 54.1 | 26.7 | 5.1 | 8.9 | 2.0 | 1.068 | 36.7 | 5.0 |
| Shepody | 81.2 | 608.9 | 494.2 | 58.1 | 270.2 | 123.0 | 42.9 | 71.3 | 565.5 | 38.0 | 5.5 | 5.9 | 8.5 | 1.9 | 1.072 | 41.8 | 0.0 |
| A07098-4 | 84.5 | 582.3 | 492.2 | 4.2 | 140.0 | 231.1 | 116.9 | 12.1 | 504.2 | 69.8 | 8.3 | 5.2 | 9.2 | 1.7 | 1.073 | 33.8 | 0.0 |
| A07547-4adg | 93.9 | 567.3 | 532.6 | 25.9 | 245.4 | 199.5 | 61.9 | 1.0 | 533.6 | 28.0 | 5.6 | 5.5 | 8.6 | 1.4 | 1.078 | 47.3 | 0.0 |
| A07705-4 | 78.9 | 639.2 | 504.6 | 0.0 | 78.0 | 280.7 | 145.9 | 4.4 | 509.0 | 120.1 | 10.1 | 6.1 | 8.7 | 1.4 | 1.069 | 36.5 | 0.0 |
| A08422-4VRsto | 86.2 | 523.7 | 451.6 | 4.2 | 202.3 | 189.7 | 55.4 | 31.0 | 482.5 | 33.2 | 8.0 | 4.8 | 9.1 | 1.6 | 1.079 | 40.0 | 0.0 |
| A08510-1LB | 83.2 | 624.9 | 520.2 | 4.5 | 161.9 | 244.7 | 109.2 | 4.4 | 524.6 | 86.5 | 13.8 | 5.7 | 9.1 | 1.4 | 1.085 | 44.0 | 0.0 |
| A09022-4 | 77.3 | 433.1 | 334.6 | 0.0 | 67.1 | 149.5 | 118.0 | 8.4 | 343.0 | 80.5 | 9.6 | 4.1 | 8.8 | 1.5 | 1.077 | 47.3 | 0.0 |
| AOR08540-1 | 80.6 | 634.6 | 511.5 | 36.8 | 300.0 | 135.5 | 39.2 | 66.6 | 578.1 | 31.7 | 24.8 | 5.9 | 9.0 | 2.1 | 1.085 | 40.1 | 2.5 |
| AOR10204-3 | 83.5 | 624.8 | 521.7 | 4.9 | 186.1 | 222.8 | 108.0 | 32.7 | 554.4 | 60.2 | 10.2 | 5.7 | 9.1 | 2.1 | 1.073 | 37.5 | 10.0 |
| OR12133-10 | 82.9 | 661.2 | 548.2 | 14.2 | 234.9 | 215.4 | 83.7 | 20.5 | 568.8 | 66.9 | 25.6 | 6.4 | 8.6 | 1.9 | 1.077 | 35.2 | 12.5 |
| POR12NCK50-1 | 87.1 | 636.9 | 554.9 | 7.2 | 194.2 | 237.9 | 115.6 | 6.3 | 561.2 | 66.6 | 9.1 | 5.7 | 9.3 | 1.7 | 1.085 | 49.1 | 0.0 |
| Mean | 80.2 | 602.0 | 482.0 | 13.6 | 190.6 | 194.2 | 83.6 | 41.2 | 523.2 | 59.5 | 19.3 | 5.6 | 8.9 | 1.8 | 1.076 | 40.3 | 2.9 |
| LSD (0.05) | 6.0 | 95.0 | 96.4 | 24.7 | 80.1 | 47.6 | 24.3 | 39.6 | 106.5 | 22.7 | 35.6 | 1.1 | NS | 0.2 | 0.005 | 5.2 | NS |

Table 2. Tristate Russet Trial tuber internal defects, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Vascular discoloration | Hollow heart | Internal brown spot | Black spot bruise |
|-----------------|------------------------|--------------|---------------------|-------------------|
| | ----- % ----- | | | |
| Ranger Russet | 0.0 | 0.0 | 0.0 | 0.0 |
| Russet Burbank | 0.0 | 0.0 | 7.5 | 0.0 |
| Russet Norkotah | 0.0 | 0.0 | 0.0 | 0.0 |
| Shepody | 0.0 | 0.0 | 0.0 | 0.0 |
| A07098-4 | 0.0 | 0.0 | 0.0 | 0.0 |
| A07547-4adg | 0.0 | 0.0 | 0.0 | 0.0 |
| A07705-4 | 0.0 | 0.0 | 5.0 | 0.0 |
| A08422-4VRsto | 0.0 | 0.0 | 2.5 | 0.0 |
| A08510-1LB | 0.0 | 0.0 | 0.0 | 0.0 |
| A09022-4 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR08540-1 | 0.0 | 0.0 | 0.0 | 2.5 |
| AOR10204-3 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR12133-10 | 0.0 | 0.0 | 2.5 | 0.0 |
| POR12NCK50-1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mean | 0.0 | 0.0 | 1.3 | 0.2 |
| LSD (0.05) | NS | NS | NS | NS |

Table 3. Tristate Russet Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

| Variety | K or D | Description |
|-----------------|----------|--|
| Ranger Russet | 2k, D, d | water rot, 2 curved, 2 Curved, pointed, irregular shape, Irregular shape, 2 heart shape, 2 growth cracks |
| Russet Burbank | 4D | water rot, Water Rot, growth cracks, 2 pointed, 2 Pointed, 3 curved, Curved, 3 knobs, Knobs, irr. shape, Irr. Shape, lumpy, jelly end rot, 2 Bottle Neck |
| Russet Norkotah | 4k | curved, growth cracks, water rot |
| Shepody | d, 3D | Lumpy, 2 heart shape, growth cracks, 3 Irregular Shape, 2 curved, 2 pointed, knobs, Bottle Neck |
| A07098-4 | 4D | 4 Sprouts, extensive sprouting, irregular shape, pointed, heart shape, swollen lenticels |
| A07547-4adg | k, 3d | 3 chipper?, 2 round, Round, too round, nice |
| A07705-4 | 4D | sprouts, 3 Sprouts, 2 Rounds, too small, pointed, Pointed |
| A08422-4VRsto | k, 2d, D | 3 growth cracks, low yield, 3 irregular shape, curved, odd shape, inconsistent shape, lumpy |
| A08510-1LB | 2k, 2d | flat, 2 heart shape, 3 too round |
| A09022-4 | 2d, 2D | small, round, too round, 2 Round, low yield, Sprouts, growth cracks |
| AOR08540-1 | 2K, 2d | 2 Nice, 2 irregular shape, 2 curved, Curved, pointed, Pointed, swollen lenticels, heart shape |
| AOR10204-3 | 3d, D | pointed, 3 Pointed, curved, knobs, irregular shape, heart shape |
| OR12133-10 | k, 2d, D | 2 irregular shape, 2 sprouts, water rot, curved, Pointed, inconsistent shape, swollen lenticels |
| POR12NCK50-1 | k, 2K, d | nice, Nice, 2 irregular shape, sprouts, chain |

Table 4. Oregon Statewide Russet Trial potato yield, grade, and processing quality, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Percent No. 1 | Total yield | U.S. No. 1 | | | | U.S. No. 2 | Marketable | <4 oz | Cull | Average tuber weight | No. of tubers /plant | Length/width ratio | Specific gravity | Average fry | | |
|-----------------|---------------|-------------|------------|--------|-------------|------------|------------|------------|-------|-------|----------------------|----------------------|--------------------|--------------------|-------------|--------------------------|------------|
| | | | Total | >20 oz | 10 to 20 oz | 6 to 10 oz | | | | | | | | | 4 to 6 oz | color, light reflectance | Sugar ends |
| | % | | cwt/acre | | | | | | | | oz | | ratio | g cm ⁻³ | % ----- | | |
| Ranger Russet | 68.7 | 756.7 | 520.2 | 24.2 | 281.6 | 171.0 | 67.6 | 162.0 | 706.4 | 48.1 | 2.2 | 5.8 | 11.1 | 1.9 | 1.086 | 41.2 | 0.0 |
| Russet Burbank | 53.0 | 668.9 | 354.8 | 7.3 | 138.0 | 157.0 | 59.8 | 246.7 | 608.7 | 57.6 | 2.6 | 5.1 | 11.0 | 2.1 | 1.073 | 33.0 | 37.5 |
| Russet Norkotah | 79.5 | 562.5 | 447.5 | 6.7 | 171.4 | 193.7 | 82.3 | 34.4 | 488.6 | 73.0 | 0.9 | 4.0 | 11.9 | 1.7 | 1.075 | 36.4 | 10.0 |
| AOR11217-3 | 85.4 | 753.7 | 643.4 | 0.0 | 169.5 | 317.4 | 156.5 | 16.9 | 660.4 | 91.4 | 1.9 | 6.0 | 10.4 | 1.7 | 1.091 | 44.6 | 0.0 |
| AOR10633-1 | 75.7 | 892.7 | 676.1 | 40.1 | 402.5 | 218.9 | 54.8 | 130.8 | 847.1 | 44.2 | 1.5 | 6.4 | 11.7 | 1.7 | 1.088 | 42.3 | 10.0 |
| AOR12145-3 | 83.9 | 598.6 | 502.0 | 2.2 | 161.4 | 240.9 | 99.7 | 25.8 | 529.9 | 60.3 | 8.4 | 4.8 | 10.3 | 1.5 | 1.094 | 38.5 | 7.5 |
| AOR12149-1 | 70.4 | 776.2 | 546.1 | 48.8 | 351.6 | 142.1 | 52.4 | 141.5 | 736.4 | 39.8 | 0.0 | 5.2 | 12.4 | 1.9 | 1.081 | 43.0 | 5.0 |
| AOR12176-4 | 42.9 | 790.2 | 338.7 | 17.9 | 164.6 | 120.3 | 53.7 | 301.6 | 658.2 | 109.8 | 22.2 | 5.6 | 11.7 | 1.6 | 1.069 | 37.6 | 15.0 |
| AOR12342-2 | 78.9 | 629.0 | 496.0 | 4.8 | 195.7 | 221.0 | 79.3 | 63.7 | 564.4 | 63.2 | 1.3 | 4.9 | 10.7 | 1.7 | 1.091 | 45.7 | 0.0 |
| AOR12344-21 | 83.5 | 817.8 | 683.1 | 9.8 | 227.9 | 316.3 | 138.9 | 30.0 | 723.0 | 93.7 | 1.1 | 6.2 | 10.9 | 1.6 | 1.093 | 46.5 | 0.0 |
| AOR12347-5 | 81.2 | 872.0 | 708.0 | 33.6 | 359.3 | 262.8 | 85.8 | 33.8 | 775.5 | 95.0 | 1.5 | 6.1 | 11.9 | 1.6 | 1.087 | 32.3 | 25.0 |
| AOR12350-5 | 84.2 | 637.7 | 536.9 | 17.9 | 287.0 | 190.9 | 59.0 | 44.7 | 599.5 | 38.2 | 0.0 | 4.5 | 11.9 | 1.7 | 1.077 | 43.9 | 0.0 |
| AOR12386-5 | 80.8 | 797.3 | 644.3 | 0.0 | 167.5 | 313.2 | 163.6 | 7.1 | 651.4 | 143.1 | 2.8 | 5.8 | 11.6 | 1.7 | 1.097 | 41.9 | 5.0 |
| AOR13011-1 | 84.2 | 686.6 | 578.3 | 25.1 | 328.4 | 183.6 | 66.2 | 33.2 | 636.5 | 45.8 | 4.3 | 5.3 | 10.9 | 1.8 | 1.083 | 40.2 | 0.0 |
| AOR13011-2 | 85.1 | 657.8 | 559.5 | 27.4 | 298.8 | 197.2 | 63.5 | 23.5 | 610.4 | 46.2 | 1.2 | 5.0 | 11.0 | 1.8 | 1.082 | 42.1 | 2.5 |
| AOR13018-5 | 72.4 | 573.0 | 415.0 | 69.3 | 265.2 | 121.5 | 28.4 | 61.1 | 545.5 | 27.4 | 0.2 | 4.1 | 11.7 | 1.6 | 1.070 | 41.9 | 0.0 |
| AOR13038-1 | 65.9 | 745.0 | 491.2 | 50.3 | 315.5 | 146.4 | 29.2 | 172.2 | 713.7 | 25.5 | 5.8 | 5.6 | 11.1 | 2.1 | 1.081 | 43.1 | 2.5 |
| AOR13058-9 | 81.3 | 511.5 | 416.0 | 8.7 | 159.5 | 163.7 | 92.8 | 26.9 | 451.6 | 58.7 | 1.2 | 3.5 | 12.2 | 1.6 | 1.081 | 38.2 | 5.0 |
| AOR13061-20 | 73.3 | 735.9 | 539.5 | 47.3 | 248.2 | 202.3 | 89.0 | 67.5 | 654.3 | 80.2 | 1.5 | 5.1 | 12.1 | 1.7 | 1.097 | 41.7 | 2.5 |
| AOR13063-3 | 80.8 | 656.2 | 530.3 | 66.8 | 320.2 | 146.8 | 63.2 | 14.6 | 611.7 | 44.5 | 0.0 | 4.8 | 11.5 | 1.7 | 1.086 | 40.7 | 0.0 |
| AOR13082-6 | 84.3 | 577.4 | 486.9 | 11.1 | 159.9 | 232.3 | 94.7 | 4.2 | 502.2 | 75.2 | 0.0 | 4.3 | 11.2 | 1.7 | 1.089 | 37.8 | 2.5 |
| AOR13107-2 | 71.5 | 683.6 | 488.8 | 124.2 | 339.1 | 119.3 | 30.4 | 32.3 | 645.4 | 35.9 | 2.3 | 5.1 | 11.2 | 1.7 | 1.092 | 44.6 | 0.0 |
| AOR11847-2 | 71.7 | 838.4 | 601.2 | 52.4 | 311.5 | 219.1 | 70.7 | 108.4 | 762.0 | 66.0 | 10.5 | 5.9 | 11.9 | 1.6 | 1.094 | 37.0 | 5.0 |
| POR15NCYK022-1 | 74.0 | 463.3 | 343.0 | 4.5 | 92.6 | 163.0 | 87.4 | 36.6 | 384.0 | 78.7 | 0.6 | 3.3 | 11.7 | 1.7 | 1.080 | 41.1 | 2.5 |
| OR13SPC101-8 | 80.5 | 791.9 | 637.5 | 8.8 | 237.4 | 296.3 | 103.9 | 55.3 | 701.7 | 89.4 | 0.8 | 5.6 | 11.9 | 1.4 | 1.095 | 40.3 | 0.0 |
| AOR13066-1 | 83.5 | 811.2 | 677.0 | 26.9 | 329.1 | 259.6 | 88.2 | 36.0 | 739.9 | 68.4 | 2.9 | 5.7 | 11.9 | 1.7 | 1.101 | 45.6 | 0.0 |
| AOR12327-3 | 75.2 | 487.6 | 366.8 | 0.0 | 74.4 | 206.1 | 86.4 | 62.8 | 429.6 | 56.4 | 1.6 | 3.7 | 11.0 | 1.7 | 1.079 | 37.7 | 0.0 |
| AOR13343-16 | 71.5 | 687.0 | 490.9 | 1.4 | 144.8 | 230.0 | 116.1 | 15.7 | 508.1 | 177.3 | 1.5 | 5.3 | 10.9 | 1.5 | 1.090 | 38.3 | 7.5 |
| OR14SP016-3 | 80.1 | 636.7 | 509.8 | 4.8 | 186.9 | 246.4 | 76.6 | 57.5 | 572.1 | 61.7 | 3.0 | 4.5 | 11.6 | 1.9 | 1.080 | 38.2 | 12.5 |
| AOR13075-10 | 67.0 | 535.5 | 359.0 | 69.2 | 190.2 | 123.5 | 45.2 | 63.6 | 491.8 | 43.8 | 0.0 | 3.8 | 11.8 | 1.5 | 1.070 | 34.1 | 10.0 |
| AOR13064-2 | 84.8 | 632.8 | 536.4 | 9.5 | 206.3 | 237.4 | 92.7 | 18.1 | 564.0 | 68.3 | 0.5 | 4.5 | 11.8 | 1.8 | 1.093 | 47.9 | 0.0 |
| Mean | 76.0 | 686.0 | 520.1 | 26.5 | 235.0 | 205.2 | 79.9 | 68.7 | 615.3 | 68.0 | 2.7 | 5.0 | 11.5 | 1.7 | 1.0854 | 40.6 | 5.4 |
| LSD (0.05) | 8.6 | 106.5 | 98.2 | 30.5 | 84.6 | 52 | 26.9 | 57.5 | 10.8 | 26.1 | NS | 1.1 | NS | 0.2 | 0.001 | 3.4 | 12.3 |

Table 5. Oregon Statewide Russet Trial tuber internal defects, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Vascular discoloration | Hollow heart | Internal brown spot | Black spot bruise |
|-----------------|------------------------|--------------|---------------------|-------------------|
| | ----- % ----- | | | |
| Ranger Russet | 0.0 | 0.0 | 0.0 | 2.5 |
| Russet Burbank | 0.0 | 0.0 | 7.5 | 0.0 |
| Russet Norkotah | 0.0 | 0.0 | 7.5 | 0.0 |
| AOR11217-3 | 0.0 | 0.0 | 15.0 | 0.0 |
| AOR10633-1 | 0.0 | 0.0 | 17.5 | 5.0 |
| AOR12145-3 | 0.0 | 0.0 | 27.5 | 5.0 |
| AOR12149-1 | 0.0 | 0.0 | 0.0 | 5.0 |
| AOR12176-4 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR12342-2 | 0.0 | 0.0 | 5.0 | 15.0 |
| AOR12344-21 | 0.0 | 0.0 | 2.5 | 0.0 |
| AOR12347-5 | 0.0 | 0.0 | 2.5 | 2.5 |
| AOR12350-5 | 0.0 | 0.0 | 0.0 | 5.0 |
| AOR12386-5 | 0.0 | 0.0 | 0.0 | 2.5 |
| AOR13011-1 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13011-2 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13018-5 | 0.0 | 0.0 | 0.0 | 7.5 |
| AOR13038-1 | 0.0 | 0.0 | 5.0 | 7.5 |
| AOR13058-9 | 0.0 | 0.0 | 5.0 | 10.0 |
| AOR13061-20 | 0.0 | 0.0 | 0.0 | 2.5 |
| AOR13063-3 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13082-6 | 0.0 | 0.0 | 0.0 | 2.5 |
| AOR13107-2 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR11847-2 | 0.0 | 0.0 | 0.0 | 0.0 |
| POR15NCYK022-1 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR13SPC101-8 | 0.0 | 0.0 | 42.5 | 5.0 |
| AOR13066-1 | 0.0 | 0.0 | 17.5 | 7.5 |
| AOR12327-3 | 0.0 | 0.0 | 2.5 | 0.0 |
| AOR13343-16 | 0.0 | 0.0 | 7.5 | 0.0 |
| OR14SP016-3 | 0.0 | 0.0 | 5.0 | 2.5 |
| AOR13075-10 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13064-2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Average | 0.0 | 0.0 | 5.5 | 2.8 |
| LSD (0.05) | NS | NS | 14.4 | NS |

Table 6. Oregon Statewide Russet Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

| Variety | K or D | Description |
|-----------------|----------|--|
| Ranger Russet | 2D, d, k | Growth Cracks, 3 growth cracks, 2 Irregular shape, irregular shape, Bottleneck, 3 bottleneck, 2 dumbbell, 2 pointed, Curved, 3 curved |
| Russet Burbank | 4D | Curved, 3 curv., Pointed, 3 point., dumbbell, Jelly End, jelly end, water rot, heart shape, Irr. Shape, irr. shape, bottleneck, growth cracks, knobs |
| Russet Norkotah | D,2d,k | Pointed, 3 pointed, heart shape, dumbbell, 2 low yield, sprouted, knobs, growth cracks |
| AOR11217-3 | D,k,2K | 2 pointed, Sprouted, sprouted, small, irregular shape |
| AOR10633-1 | D,d,K,k | 4 pointed, Growth Cracks, 3 growth cracks, sprouted, 2 curved, heart shaped |
| AOR12145-3 | K,3k | 2 dumbbell, 2 growth cracks, pointed, inconsistent shape, round, small |
| AOR12149-1 | 2D,d,k | 4 growth cracks, 2 curved, Bottleneck, 3 bottleneck, 2 knobs, pointed, lumpy, Irregular Shape, |
| AOR12176-4 | 4D | 3 Growth Cracks, Dumbbell, dumbbell, Curved, 2 curved, 2 Pointed, 2 pointed, 2 Irregular Shape, knobs, Bottleneck, 2 bottleneck, Sprouted |
| AOR12342-2 | 2D,d,k | 2 Alligator Hide, dumbbell, 3 curved, 2 sprouted, 2 bottleneck, pointed, knobs, heart shape |
| AOR12344-21 | K,3k | 3 growth cracks, sprouted, one sprouted, curved, bottleneck |
| AOR12347-5 | 3D, k | Pointed, 2 pointed, 3 Sprouted, sprouted, 2 growth cracks |
| AOR12350-5 | K,3k | 4 pointed, 2 sprouted, 3 bottleneck, 2 growth cracks |
| AOR12386-5 | 3d,k | 3 sprouted, curved, 3 pointed, small, some small, skin cracks, growth cracks |
| AOR13011-1 | d,3k | rough, 2 deep eyes, dumbbell, 2 Pointed, pointed |
| AOR13011-2 | D,d,2K | Pointed, 3 pointed, 2 heart shape, bottleneck |
| AOR13018-5 | 2D,d,K | Irregular Shape, irregular shape, 2 pointed, 2 knobs, lumpy, rough skin |
| AOR13038-1 | 3D,d | 2 growth cracks, 3 curved, 3 Pointed, pointed, Irregular Shape |
| AOR13058-9 | D,K,2k | 2 sprouted, folded bud end, bottleneck, 2 growth cracks, heart shaped |
| AOR13061-20 | D,2d,K | 3 growth cracks, bottleneck, 4 pointed, Sprouted, 2 sprouted, round, knobs |
| AOR13063-3 | D,2d,K | Irregular Shape, 2 irregular shape, 2 pointed, growth cracks, curved, inconsistent shape |
| AOR13082-6 | 2K,2k | growth cracks, small |
| AOR13107-2 | 2K,2k | flat, 2 sprouted, 2 curved |
| AOR11847-2 | 2D,d,k | 2 Pointed, 2 pointed, Irregular Shape, 2 irregular shape, 2 sprouted, curved, bottleneck, knobs, greening |
| POR15NCYK022-1 | 2D,d,K | 3 sprouted, rough skin, pointed, 2 bottleneck, 2 knobs, 2 low yield, 2 heart shape, (may contain a better variety, 1 hill) |
| OR13SPC101-8 | D,3d | Sprouted, 2 sprouted, 3 growth cracks, knobs, 3 round, pointed, Irregular Shape |
| AOR13066-1 | 2D,d,K | 4 pointed, Sprouted, 2 sprouted, dumbbell, curved, heart shape, growth cracks, 2 bottleneck, 2 knobs |
| AOR12327-3 | D,2d,k | Bottleneck, 2 bottleneck, 2 growth cracks, 3 curved, 3 pointed, dumbbell, low yield |
| AOR13343-16 | 3D,d | 4 Sprouted, small, chain |
| OR14SP016-3 | D,3d | 2 sprouted, Pointed, 3 pointed, 3 bottleneck, curved, growth cracks |
| AOR13075-10 | D,3d | 3 irregular shape, round, 2 bottleneck, 2 growth cracks, inconsistent (one better hill, lighter skin), Sprouted, irregular shape |
| AOR13064-2 | 2d,2k | Pointed, 3 pointed |

Table 7. Preliminary Yield Russet Trial yield, grade, and processing quality for selected varieties, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Percent No. 1 % | U.S. No. 1 | | | | U.S. No. 2 | Marketable | <4 oz | Cull | Average tuber weight oz | No. of tubers /plant | Length/width ratio | Specific gravity g/cm ³ | Average fry color, light reflectance % | Sugar ends | | |
|-----------------|-----------------|-------------|--------|-------------|------------|------------|------------|-------|-------|-------------------------|----------------------|--------------------|------------------------------------|--|------------|-----------|------|
| | | Total yield | >20 oz | 10 to 20 oz | 6 to 10 oz | | | | | | | | | | | 4 to 6 oz | |
| Ranger Russet | 65.5 | 773.2 | 506.3 | 24.0 | 276.3 | 157.8 | 72.2 | 177.9 | 708.1 | 65.1 | 0.0 | 7.7 | 8.3 | 1.67 | 1.0901 | 38.3 | 0.0 |
| Russet Burbank | 61.7 | 590.5 | 364.4 | 62.5 | 125.8 | 182.4 | 56.2 | 123.9 | 550.8 | 39.7 | 0.0 | 22.1 | 6.7 | 2.04 | 1.0722 | 30.9 | 50.0 |
| Russet Norkotah | 81.4 | 399.7 | 325.4 | 0.0 | 90.3 | 131.6 | 103.5 | 14.8 | 340.2 | 59.5 | 0.0 | 19.2 | 6.2 | 1.88 | 1.0717 | 36.9 | 0.0 |
| AOR10067-5 | 80.2 | 517.9 | 415.2 | 69.8 | 271.7 | 103.2 | 40.3 | 14.3 | 499.3 | 18.6 | 0.0 | 24.6 | 4.4 | 1.47 | 1.0670 | 36.6 | 0.0 |
| AOR10067-6 | 79.5 | 453.6 | 360.6 | 22.8 | 227.8 | 84.7 | 48.2 | 39.5 | 423.0 | 30.6 | 0.0 | 22.6 | 4.7 | 1.92 | 1.0596 | 36.5 | 0.0 |
| AOR10067-15 | 80.8 | 561.6 | 453.8 | 28.2 | 278.5 | 106.8 | 68.4 | 22.3 | 504.2 | 51.3 | 6.1 | 22.3 | 5.8 | 1.50 | 1.0773 | 42.9 | 0.0 |
| AOR10067-20 | 86.2 | 494.7 | 426.5 | 0.0 | 182.7 | 172.9 | 71.0 | 21.3 | 447.8 | 46.9 | 0.0 | 21.2 | 6.0 | 1.74 | 1.0821 | 40.7 | 0.0 |
| AOR10067-28 | 68.5 | 379.1 | 259.5 | 76.5 | 169.5 | 65.0 | 25.0 | 22.7 | 358.7 | 17.8 | 2.6 | 24.2 | 3.4 | 1.76 | 1.0666 | 45.3 | 0.0 |
| AOR10129-1 | 86.9 | 783.9 | 681.5 | 6.4 | 343.1 | 246.9 | 91.5 | 21.6 | 709.5 | 74.4 | 0.0 | 21.2 | 9.8 | 1.71 | 1.0902 | 48.6 | 0.0 |
| AOR10129-3 | 77.4 | 648.7 | 502.1 | 0.0 | 107.0 | 294.6 | 100.4 | 54.6 | 556.7 | 87.5 | 4.5 | 20.0 | 9.5 | 2.17 | 1.0760 | 36.7 | 20.0 |
| AOR10150-1 | 71.9 | 803.9 | 577.7 | 116.0 | 370.8 | 152.2 | 54.7 | 42.1 | 735.7 | 66.3 | 1.9 | 22.8 | 8.3 | 1.33 | 1.0924 | 46.3 | 0.0 |
| AOR10222-2 | 83.5 | 529.2 | 441.8 | 13.3 | 151.2 | 202.4 | 88.3 | 3.7 | 458.9 | 70.3 | 0.0 | 20.1 | 7.4 | 1.45 | 1.0992 | 46.2 | 0.0 |
| AOR11027-4 | 89.2 | 621.1 | 554.1 | 19.7 | 334.6 | 176.2 | 43.2 | 5.9 | 579.7 | 41.4 | 0.0 | 22.5 | 6.8 | 1.82 | 1.0921 | 45.5 | 0.0 |
| AOR12082-7 | 85.9 | 732.1 | 628.7 | 32.5 | 333.5 | 204.7 | 90.5 | 21.2 | 682.4 | 49.8 | 0.0 | 7.8 | 7.8 | 1.59 | 1.0884 | 42.9 | 0.0 |
| AOR14015-5 | 85.9 | 520.2 | 447.0 | 0.0 | 115.6 | 221.0 | 110.4 | 1.3 | 448.3 | 71.9 | 0.0 | 6.0 | 7.2 | 1.52 | 1.0880 | 44.6 | 0.0 |
| AOR14015-7 | 85.7 | 540.1 | 462.9 | 6.1 | 217.3 | 179.9 | 65.7 | 31.9 | 500.8 | 39.3 | 0.0 | 7.0 | 6.4 | 2.00 | 1.0852 | 42.2 | 0.0 |
| AOR14016-8 | 86.6 | 647.1 | 560.5 | 6.2 | 173.7 | 263.3 | 123.4 | 8.9 | 575.6 | 71.5 | 0.0 | 6.0 | 8.9 | 1.55 | 1.0885 | 40.0 | 0.0 |
| AOR14032-12 | 90.0 | 706.1 | 635.7 | 0.0 | 249.1 | 275.0 | 111.7 | 9.7 | 645.4 | 60.6 | 0.0 | 6.7 | 8.8 | 1.71 | 1.0917 | 42.9 | 0.0 |
| AOR14033-1 | 53.8 | 670.3 | 360.7 | 217.7 | 260.5 | 81.7 | 18.5 | 76.0 | 654.4 | 15.9 | 0.0 | 12.0 | 4.6 | 1.70 | 1.0835 | 43.5 | 0.0 |
| AOR14051-3 | 77.1 | 668.5 | 515.2 | 103.0 | 253.6 | 186.3 | 75.3 | 8.3 | 626.5 | 42.1 | 0.0 | 8.6 | 6.5 | 1.47 | 1.0948 | 43.7 | 0.0 |
| OR13SP175-6 | 83.5 | 673.8 | 562.9 | 64.4 | 353.7 | 160.3 | 48.9 | 21.6 | 648.9 | 24.9 | 0.0 | 9.3 | 6.0 | 1.48 | 1.0813 | 40.6 | 0.0 |
| AOR10603-5 | 68.4 | 672.6 | 460.0 | 108.0 | 278.9 | 147.8 | 33.3 | 52.5 | 620.5 | 52.1 | 0.0 | 8.0 | 7.0 | 1.69 | 1.0938 | 39.9 | 0.0 |
| AOR10648-5 | 83.4 | 663.4 | 553.3 | 57.2 | 315.8 | 183.5 | 54.0 | 2.3 | 612.7 | 50.6 | 0.0 | 7.2 | 7.6 | 1.25 | 1.0916 | 41.5 | 0.0 |
| AOR10654-11 | 83.2 | 897.9 | 747.3 | 51.5 | 379.2 | 273.7 | 94.4 | 26.3 | 825.2 | 72.7 | 0.0 | 7.4 | 10.0 | 1.64 | 1.0967 | 43.0 | 0.0 |
| AOR10673-14 | 73.4 | 617.8 | 453.6 | 138.9 | 332.8 | 102.1 | 18.6 | 0.0 | 592.5 | 25.3 | 0.0 | 10.7 | 4.8 | 1.66 | 1.0706 | 40.2 | 0.0 |
| AOR10673-25 | 72.2 | 448.1 | 323.4 | 96.7 | 229.7 | 77.2 | 16.4 | 11.5 | 431.5 | 16.6 | 0.0 | 10.4 | 3.6 | 1.79 | 1.0683 | 42.3 | 0.0 |
| AOR10786-1 | 76.8 | 823.2 | 632.6 | 7.4 | 247.4 | 261.6 | 123.6 | 66.2 | 706.2 | 106.1 | 10.9 | 6.6 | 10.3 | 1.85 | 1.0844 | 39.9 | 0.0 |
| AOR11902-1 | 76.3 | 762.0 | 581.5 | 67.0 | 369.1 | 163.7 | 48.6 | 74.8 | 723.2 | 38.7 | 0.0 | 9.1 | 7.0 | 1.82 | 1.0824 | 33.4 | 20.0 |
| AOR11847-6 | 84.8 | 591.9 | 501.8 | 13.3 | 221.4 | 167.0 | 113.4 | 18.9 | 534.0 | 57.9 | 0.0 | 6.6 | 7.4 | 1.60 | 1.0985 | 47.7 | 0.0 |
| AOR11847-15 | 81.9 | 728.9 | 597.1 | 13.2 | 239.1 | 267.1 | 90.8 | 27.5 | 637.8 | 91.1 | 0.0 | 6.2 | 9.7 | 1.59 | 1.0902 | 45.1 | 0.0 |
| AOR13113-1 | 76.2 | 688.6 | 524.4 | 28.2 | 240.4 | 209.1 | 75.0 | 47.4 | 600.0 | 88.6 | 0.0 | 6.3 | 9.1 | 1.71 | 1.0785 | 37.2 | 0.0 |
| AOR12312-1 | 79.1 | 714.3 | 564.8 | 90.9 | 366.4 | 143.2 | 55.3 | 8.6 | 664.3 | 49.9 | 0.0 | 8.0 | 7.4 | 1.52 | 1.0850 | 38.8 | 0.0 |
| AOR12312-6 | 81.6 | 777.9 | 634.6 | 63.7 | 332.9 | 216.6 | 85.0 | 38.0 | 736.4 | 40.4 | 1.2 | 8.2 | 7.8 | 1.79 | 1.0802 | 39.2 | 0.0 |
| AOR12321-18 | 85.7 | 815.2 | 698.5 | 6.9 | 238.5 | 358.9 | 101.1 | 35.0 | 740.4 | 74.9 | 0.0 | 6.2 | 10.9 | 1.63 | 1.0960 | 41.0 | 0.0 |
| AOR13088-2 | 70.5 | 676.2 | 476.9 | 130.8 | 275.9 | 160.7 | 40.3 | 12.6 | 620.2 | 52.3 | 3.7 | 7.7 | 7.3 | 1.47 | 1.0773 | 35.7 | 0.0 |
| OR13SP142-2 | 84.7 | 634.6 | 537.8 | 21.4 | 200.2 | 210.6 | 127.1 | 1.2 | 560.4 | 74.2 | 0.0 | 6.6 | 8.0 | 1.56 | 1.0904 | 41.7 | 0.0 |
| POR16V2-3 | 83.2 | 618.0 | 514.3 | 0.0 | 100.3 | 253.3 | 160.7 | 2.0 | 516.3 | 101.6 | 0.0 | 5.3 | 9.7 | 1.37 | 1.0826 | 38.8 | 0.0 |
| AOR13338-2 | 80.9 | 598.6 | 484.4 | 56.1 | 286.2 | 135.2 | 62.9 | 18.9 | 559.4 | 39.3 | 0.0 | 9.1 | 5.4 | 1.54 | 1.0780 | 40.4 | 0.0 |
| OR13SP115-1 | 79.0 | 458.3 | 362.2 | 0.0 | 114.8 | 158.3 | 89.1 | 15.7 | 377.9 | 80.4 | 0.0 | 5.5 | 6.9 | 1.71 | 1.0803 | 39.5 | 0.0 |
| A10508-2KF | 86.5 | 690.3 | 596.8 | 38.1 | 351.4 | 168.4 | 77.1 | 19.3 | 654.2 | 36.1 | 0.0 | 8.3 | 6.9 | 1.45 | 1.0906 | 40.5 | 0.0 |

Table 8. Preliminary Yield Russet Trial tuber visual observations at harvest for selected varieties, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters.

| Variety | K or D | Description |
|-----------------|--------|---|
| Ranger Russet | k/d | Curved, knobs, Irregular shape |
| Russet Burbank | d | Irregular shape, dumbbell, knobs |
| Russet Norkotah | D | sprouted, chain |
| AOR10067-5 | K | irregular shape |
| AOR10067-6 | d/k | sprouted, alligator hide, water rot |
| AOR10067-15 | k | heart shaped, Irregular shape, misshapen |
| AOR10067-20 | k | heart shaped, Irregular shape, misshapen |
| AOR10067-28 | k | heart shaped, Irregular shape, misshapen |
| AOR10129-1 | K | pointed, irregular shape, dumbbell, swollen lenticels |
| AOR10129-3 | d/k | growth cracks, small |
| AOR10150-1 | k | sprouted, Round, growth cracks |
| AOR10222-2 | k | small, sprouted |
| AOR11027-4 | K | sprouted, irregular shape |
| AOR12082-7 | k | irregular shape |
| AOR14015-5 | k | small |
| AOR14015-7 | k | sprouted, growth cracks, pointed |
| AOR14016-8 | k | bottleneck, irregular shape |
| AOR14032-12 | k | Pointed, growth cracks |
| AOR14033-1 | k | knobs, deep eyes, pointed, jelly end |
| AOR14051-3 | K | |
| OR13SP175-6 | K | round |
| AOR10603-5 | k | growth cracks, sprouted, knobs, heart shaped, curved |
| AOR10648-5 | k | pointed, sprouted |
| AOR10654-11 | K | |
| AOR10673-14 | K | irregular shape, skin cracks, a winner |
| AOR10673-25 | k | knobs, growth cracks, irregular shape |
| AOR10786-1 | k | greening, (one mixed seed piece with radical Knobs) |
| AOR11902-1 | k | heart shape, bottleneck, pointed |
| AOR11847-6 | k | growth cracks, small |
| AOR11847-15 | K | chain |
| AOR13113-1 | k | growth cracks |
| AOR12312-1 | k | pointed, sprouted |
| AOR12312-6 | K | pointed |
| AOR12321-18 | k | undersized tubes |
| AOR13088-2 | k | water rot, pointed, sprouted |
| OR13SP142-2 | K | nice, a bit small |
| POR16V2-3 | k | small, nice shape, beats Norkotah? |
| AOR13338-2 | k | sprouted, growth cracks |
| OR13SP115-1 | k | irregular shape, growth cracks, pointed |
| A10508-2KF | K | irregular shape, growth cracks |

Table 9. Preliminary Yield Russet Trial tuber internal defects, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Vascular discoloration | Hollow heart | Internal brown spot | Brown center | Black spot bruise |
|-----------------|------------------------|--------------|---------------------|--------------|-------------------|
| | | | ----- % ----- | | |
| Ranger Russet | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Russet Burbank | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Russet Norkotah | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10067-5 | 0.0 | 0.0 | 0.0 | 20.0 | 0.0 |
| AOR10067-6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10067-15 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10067-20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10067-28 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10129-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10129-3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10150-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10222-2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR11027-4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR12082-7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR14015-5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR14015-7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR14016-8 | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 |
| AOR14032-12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR14033-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR14051-3 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 |
| OR13SP175-6 | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 |
| AOR10603-5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10648-5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10654-11 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10673-14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10673-25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR10786-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR11902-1 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 |
| AOR11847-6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR11847-15 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13113-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR12312-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR12312-6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR12321-18 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13088-2 | 0.0 | 0.0 | 20.0 | 0.0 | 0.0 |
| OR13SP142-2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| POR16V2-3 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 |
| AOR13338-2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR13SP115-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| A10508-2KF | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Table 10. National Fry Processing Trial yield, grade, and processing quality for Tier 1 varieties (one replicate), Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Tier | Variety | Percent No. 1 % | Total yield | U.S. No. 1 | | | U.S. No. 2 | Marketable | <4 oz | Cull | Specific gravity g/cm ³ | |
|------|-----------------|-----------------------|----------------|----------------------|-----------|---------------|---------------|------------|-------|-------|--|--------------|
| | | | | Total | >10 oz | 6 to 10 oz | | | | | | 4 to 6 oz |
| | | | | ----- cwt/acre ----- | | | | | | | | |
| 1 | A10594-4sto | 100.0 | 608.9 | 608.9 | 316.6 | 150.6 | 97.3 | 0.0 | 608.9 | 44.4 | 0.0 | 1.086 |
| | A10595-13sto | 79.1 | 664.3 | 525.3 | 276.9 | 153.2 | 35.9 | 139.0 | 525.3 | 59.4 | 0.0 | 1.080 |
| | A10947-3CSR | 94.4 | 367.5 | 346.9 | 192.2 | 39.5 | 28.3 | 20.5 | 346.9 | 87.0 | 0.0 | 1.098 |
| | A11188-1 | 100.0 | 760.6 | 760.6 | 414.1 | 221.5 | 71.2 | 0.0 | 760.6 | 53.8 | 0.0 | 1.082 |
| | A11226-1 | 94.5 | 755.4 | 713.9 | 410.2 | 166.1 | 67.2 | 41.6 | 713.9 | 70.3 | 0.0 | 1.082 |
| | A11737-1LB | 98.8 | 444.3 | 438.7 | 37.7 | 100.4 | 177.7 | 5.6 | 438.7 | 122.9 | 0.0 | 1.093 |
| | AF5494-3 | 95.9 | 356.5 | 342.0 | 63.0 | 127.8 | 75.6 | 14.5 | 342.0 | 75.6 | 0.0 | 1.083 |
| | AF5628-2 | 94.3 | 518.3 | 488.9 | 219.9 | 147.8 | 71.4 | 25.3 | 488.9 | 49.8 | 4.1 | 1.083 |
| | AF5644-8 | 92.4 | 711.7 | 657.7 | 36.9 | 154.4 | 190.8 | 54.0 | 657.7 | 275.7 | 0.0 | 1.104 |
| | AF5661-13 | 100.0 | 634.2 | 634.2 | 82.6 | 253.6 | 151.8 | 0.0 | 634.2 | 146.2 | 0.0 | 1.087 |
| | AOR10633-1 | 98.5 | 635.9 | 626.5 | 125.6 | 285.2 | 135.8 | 9.4 | 626.5 | 79.9 | 0.0 | 1.095 |
| | CO10087-4RU | 98.9 | 530.9 | 525.2 | 59.4 | 209.6 | 165.3 | 5.7 | 525.2 | 90.9 | 0.0 | 1.096 |
| | CO10091-1RU | 98.8 | 556.5 | 550.1 | 85.4 | 237.6 | 111.4 | 6.5 | 550.1 | 115.6 | 0.0 | 1.075 |
| | COAF11149-5 | 97.8 | 547.6 | 535.4 | 86.6 | 256.7 | 103.5 | 12.3 | 535.4 | 88.5 | 0.0 | 1.119 |
| | ND12241YB-2Russ | 97.8 | 473.0 | 462.6 | 72.2 | 228.2 | 98.2 | 8.4 | 462.6 | 64.0 | 2.1 | 1.107 |
| | NDAF113476CB-3 | 78.7 | 466.3 | 367.1 | 37.3 | 167.8 | 73.7 | 99.3 | 367.1 | 88.3 | 0.0 | 1.091 |
| | TX13590-9Ru | 100.0 | 431.7 | 431.7 | 160.8 | 129.1 | 54.0 | 0.0 | 431.7 | 87.9 | 0.0 | 1.082 |
| | W13012-18rus | 98.0 | 785.2 | 769.9 | 193.2 | 231.3 | 172.3 | 15.4 | 769.9 | 173.1 | 0.0 | 1.105 |
| | W13A11229-1rus | 98.2 | 738.9 | 725.7 | 136.7 | 297.0 | 163.0 | 13.2 | 725.7 | 129.1 | 0.0 | 1.108 |
| | A10594-8VR | 94.8 | 863.3 | 818.7 | 341.5 | 268.7 | 103.8 | 37.2 | 818.7 | 104.7 | 7.5 | 1.104 |

Table 11. National Fry Processing Trial yield, grade, and processing quality for Tier 2 (2 replicates) and Tier 3 (3 replicates) varieties, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Tier | Variety | Percent No. 1 | Total yield | U.S. No. 1 | | | U.S. No. 2 | Marketable | <4 oz | Cull | Specific gravity g/cm ⁻³ | |
|------|-------------------|------------------|----------------|------------|-----------|---------------|---------------|------------|-------|-------|---|--------------|
| | | | | Total | >10 oz | 6 to 10 oz | | | | | | 4 to 6 oz |
| | | | | cwt/acre | | | | | | | | |
| 2 | A07098-4 | 97.4 | 680.1 | 663.1 | 114.7 | 293.3 | 137.1 | 15.7 | 663.1 | 118.0 | 1.2 | 1.069 |
| | A07705-4 | 98.9 | 803.6 | 794.7 | 197.3 | 296.5 | 171.0 | 8.9 | 794.7 | 130.0 | 0.0 | 1.084 |
| | A07769-4 | 100.0 | 779.0 | 779.0 | 363.8 | 240.9 | 86.9 | 0.0 | 779.0 | 87.4 | 0.0 | 1.094 |
| | AAF10237-4 | 98.4 | 721.2 | 708.7 | 120.9 | 293.5 | 145.7 | 12.5 | 708.7 | 148.6 | 0.0 | 1.093 |
| | AAF10615-1 | 96.2 | 503.2 | 484.7 | 218.8 | 173.7 | 41.0 | 16.1 | 484.7 | 51.2 | 2.5 | 1.090 |
| | AF5492-6 | 100.0 | 619.3 | 619.3 | 39.0 | 237.4 | 178.2 | 0.0 | 619.3 | 164.7 | 0.0 | 1.092 |
| | AOR08540-1 | 90.9 | 900.8 | 820.3 | 377.0 | 225.1 | 148.3 | 76.4 | 820.3 | 69.9 | 4.1 | 1.090 |
| | OR12133-10 | 97.0 | 940.7 | 911.5 | 453.0 | 310.7 | 77.0 | 29.2 | 911.5 | 70.8 | 0.0 | 1.079 |
| | Average | 97.3 | 743.5 | 722.7 | 235.6 | 258.9 | 123.2 | 19.9 | 722.7 | 105.1 | 1.0 | 1.086 |
| | LSD (0.05) | NS | 154.7 | 177.5 | 119.1 | 74.1 | 63.3 | NS | 177.5 | 37.1 | NS | NS |
| 3 | A07061-6 | 97.6 | 791.1 | 772.5 | 132.3 | 275.5 | 179.5 | 15.7 | 772.5 | 185.2 | 3.0 | 1.092 |
| | A071012-4BF | 95.3 | 834.9 | 795.3 | 496.6 | 186.7 | 62.0 | 39.7 | 795.3 | 49.9 | 0.0 | 1.105 |
| | A08433-4sto | 93.9 | 743.9 | 698.6 | 207.2 | 237.6 | 113.4 | 45.3 | 698.6 | 140.5 | 0.0 | 1.097 |
| | AAF07521-1 | 99.2 | 569.9 | 564.9 | 219.3 | 190.9 | 87.2 | 5.0 | 564.9 | 67.5 | 0.0 | 1.085 |
| | AF5071-2 | 91.4 | 611.9 | 560.4 | 188.8 | 193.0 | 99.3 | 43.4 | 560.4 | 79.3 | 8.1 | 1.095 |
| | AF5406-7 | 93.7 | 581.2 | 545.0 | 160.6 | 247.3 | 81.8 | 32.3 | 545.0 | 55.3 | 3.9 | 1.084 |
| | AO02183-2 | 93.6 | 881.9 | 824.0 | 393.4 | 234.0 | 94.4 | 56.3 | 824.0 | 102.3 | 1.6 | 1.087 |
| | AOR06576-1 | 94.7 | 795.6 | 752.6 | 260.2 | 289.9 | 98.2 | 43.0 | 752.6 | 104.3 | 0.0 | 1.094 |
| | CO09036-2RU | 75.2 | 503.2 | 377.2 | 96.6 | 84.1 | 84.6 | 126.0 | 377.2 | 111.9 | 0.0 | 1.079 |
| | ND050032-4Russ | 96.1 | 790.4 | 750.7 | 271.2 | 284.4 | 108.3 | 39.7 | 750.7 | 86.8 | 0.0 | 1.095 |
| | Russet Burbank | 51.4 | 672.7 | 335.4 | 124.9 | 114.8 | 50.9 | 312.0 | 335.4 | 44.7 | 25.4 | 1.074 |
| | Ranger Russet | 85.4 | 882.9 | 749.5 | 360.0 | 250.0 | 71.1 | 127.7 | 749.5 | 68.4 | 5.7 | 1.088 |
| | Clearwater Russet | 96.4 | 751.3 | 724.3 | 223.7 | 261.1 | 136.9 | 27.0 | 648.7 | 102.6 | 0.0 | 1.094 |
| | Payette Russet | 99.0 | 555.5 | 550.2 | 71.2 | 131.5 | 154.6 | 4.4 | 361.7 | 192.9 | 0.9 | 1.103 |
| | Dakota Russet | 99.1 | 710.6 | 704.7 | 307.1 | 266.0 | 78.2 | 5.2 | 656.6 | 53.3 | 0.7 | 1.091 |
| | Shepody | 81.7 | 501.1 | 409.2 | 101.3 | 165.9 | 70.9 | 91.9 | 430.0 | 71.1 | 0.0 | 1.073 |
| | Average | 94.0 | 649.5 | 611.4 | 200.0 | 209.6 | 106.3 | 37.8 | 605.1 | 97.9 | 1.6 | 1.090 |
| | LSD (0.05) | 12.9 | 188.6 | 174.5 | 148.9 | 70.6 | 43.8 | 99.0 | 176.3 | 45.1 | NS | 0.012 |

Table 12. Oregon Statewide Specialty Trial yield and grade of colored flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Clone/Variety | Total yield | <1¼ inch | U.S. No. 1 | | | | | U.S. No. 2 | Cull | Average tuber weight | No. of tubers/plant | Length/width ratio | Specific gravity |
|---------------|-------------|----------|----------------------|-----------|------------|-------------|--------|------------|-------|----------------------|---------------------|--------------------|--------------------|
| | | | <4 oz | 4 to 6 oz | 6 to 10 oz | 10 to 14 oz | >14 oz | | | | | | |
| | | | ----- cwt/acre ----- | | | | | | | oz | | | g cm ⁻³ |
| Yukon Gold | 475.8 | 7.1 | 45.8 | 60.6 | 171.5 | 123.5 | 57.0 | 57.0 | 17.5 | 6.4 | 6.1 | 1.3 | 1.084 |
| Chieftain | 704.8 | 15.3 | 99.5 | 138.8 | 248.4 | 130.5 | 71.1 | 71.1 | 16.6 | 5.4 | 10.8 | 1.1 | 1.088 |
| POR15PG014-8 | 619.3 | 47.0 | 304.7 | 178.5 | 100.3 | 11.0 | 0.0 | 0.0 | 24.7 | 2.8 | 18.5 | 1.0 | 1.083 |
| POR15PG034-1 | 577.8 | 46.2 | 270.2 | 165.7 | 94.9 | 14.5 | 0.0 | 0.0 | 32.5 | 2.8 | 17.1 | 1.3 | 1.094 |
| POR15PG036-3 | 547.6 | 40.9 | 225.6 | 14.6 | 0.4 | 0.0 | 0.0 | 0.0 | 307.0 | 1.5 | 29.8 | 2.0 | 1.080 |
| POR15PG015-3 | 577.9 | 32.9 | 121.6 | 15.5 | 34.8 | 11.1 | 0.0 | 0.0 | 394.9 | 1.7 | 22.2 | 0.9 | 1.066 |
| Mean | 583.8 | 31.6 | 177.9 | 95.6 | 108.4 | 48.4 | 21.3 | 21.3 | 132.2 | 3.4 | 17.4 | 1.2 | 1.082 |
| LSD (0.05) | 132.8 | 11.5 | 43.9 | 25.9 | 58.6 | 37.1 | 28.5 | 28.5 | 60.1 | 0.6 | 3.1 | 0.3 | NS |

Table 13. Oregon Statewide Specialty Trial tuber internal defects of colored flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Clone/Variety | Vascular discoloration | Hollow heart | Internal brown spot | Brown center | Black spot bruise |
|---------------|------------------------|--------------|---------------------|--------------|-------------------|
| | | | ----- % ----- | | |
| Yukon Gold | 0.0 | 0.0 | 2.5 | 2.5 | 10.0 |
| Chieftain | 2.5 | 0.0 | 42.5 | 2.5 | 10.0 |
| POR15PG014-8 | 0.0 | 0.0 | 0.0 | 0.0 | 7.5 |
| POR15PG034-1 | 0.0 | 2.5 | 0.0 | 5.0 | 2.5 |
| POR15PG036-3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| POR15PG015-3 | 0.0 | 0.0 | 12.5 | 0.0 | 0.0 |
| Mean | 0.4 | 0.4 | 9.6 | 1.7 | 5.0 |
| LSD (0.05) | NS | NS | 15.9 | NS | NS |

Table 14. Oregon Statewide Specialty Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

| Clone/Variety | K or D | Description |
|---------------|--------|---|
| Yukon Gold | D,3k | silver scurf, greening, water rot, too much rot, growth cracks, too big |
| Chieftain | 4k | dull red, too dull, sprouted |
| POR15PG014-8 | 3K,k | 2 sprouted |
| POR15PG034-1 | 4k | 4 sprouted, greening |
| POR15PG036-3 | 4D | 4 Sprouted |
| POR15PG015-3 | 4D | 4 Sprouted |

Table 15. Preliminary Yield Specialty Trial yield and grade of colored flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety/Clone | Total yield | U.S. No. 1 | | | | | | U.S. No. 2 | Cull | Twos + culls | Average tuber weight | No. of tubers /plant | Length/width ratio | Specific gravity g/cm ³ |
|----------------|-------------|----------------------|-------|-----------|------------|-------------|--------|------------|-------|--------------|----------------------|----------------------|--------------------|------------------------------------|
| | | <1.75 | <4 oz | 4 to 6 oz | 6 to 10 oz | 10 to 14 oz | >14 oz | | | | | | | |
| | | ----- cwt/acre ----- | | | | | | | | | oz | | | |
| Yukon Gold | 447.7 | 7.2 | 50.0 | 84.1 | 195.0 | 66.5 | 48.2 | 0.0 | 4.0 | 4.0 | 6.0 | 6.2 | 1.03 | 1.082 |
| Chieftain | 643.2 | 9.8 | 93.8 | 126.8 | 273.3 | 123.2 | 23.5 | 0.0 | 2.6 | 2.6 | 5.6 | 9.5 | 1.03 | 1.075 |
| Purple Majesty | 599.0 | 49.4 | 269.0 | 87.7 | 30.4 | 3.0 | 0.0 | 0.0 | 208.8 | 208.8 | 2.8 | 17.8 | 1.29 | 1.072 |
| POR16PG7-3 | 441.7 | 47.0 | 250.4 | 39.8 | 2.7 | 0.0 | 0.0 | 0.0 | 148.9 | 148.9 | 2.0 | 18.4 | 1.14 | 1.065 |
| POR16PG17-2 | 618.9 | 26.2 | 179.7 | 167.5 | 219.1 | 47.1 | 0.0 | 0.0 | 5.5 | 5.5 | 4.3 | 12.0 | 1.19 | 1.071 |
| POR16PG25-2 | 670.2 | 38.4 | 232.4 | 242.2 | 155.1 | 33.3 | 0.0 | 0.0 | 7.2 | 7.2 | 3.7 | 14.9 | 1.43 | 1.084 |
| POR16PG34-1 | 486.2 | 47.7 | 307.0 | 143.8 | 30.2 | 0.0 | 0.0 | 0.0 | 5.3 | 5.3 | 2.6 | 15.6 | 1.12 | 1.077 |
| POR16PG42-4 | 511.2 | 102.0 | 431.6 | 65.7 | 11.9 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 1.9 | 22.1 | 1.21 | 1.082 |
| NDOR13293B-1 | 539.3 | 34.8 | 257.5 | 179.4 | 86.3 | 6.6 | 0.0 | 0.0 | 9.5 | 9.5 | 2.9 | 15.3 | 1.08 | 1.063 |
| OR11157-1 | 436.6 | 95.4 | 367.6 | 28.4 | 26.5 | 9.8 | 0.0 | 0.0 | 4.3 | 4.3 | 1.5 | 24.0 | 2.44 | 1.066 |
| OR11157-10 | 297.1 | 37.6 | 215.3 | 58.9 | 21.4 | 0.0 | 0.0 | 0.0 | 1.5 | 1.5 | 2.0 | 12.5 | 3.00 | 1.065 |
| OR13SP198-2 | 708.1 | 19.7 | 113.5 | 119.2 | 234.3 | 173.2 | 65.4 | 0.0 | 2.4 | 2.4 | 5.4 | 10.8 | 1.45 | 1.089 |
| OR13SP198-4 | 551.6 | 4.8 | 79.9 | 106.5 | 197.2 | 126.8 | 25.0 | 0.0 | 16.2 | 16.2 | 5.8 | 7.8 | 1.56 | 1.070 |
| OR13SP207-1 | 536.2 | 122.0 | 406.7 | 46.2 | 15.0 | 0.0 | 0.0 | 0.0 | 68.2 | 68.2 | 1.2 | 36.8 | 1.68 | 1.075 |
| OR14H004-3 | 626.9 | 59.1 | 245.2 | 72.8 | 4.2 | 0.0 | 0.0 | 0.0 | 304.7 | 304.7 | 1.5 | 35.1 | 2.53 | 1.081 |
| Mean | 540.9 | 46.8 | 233.3 | 104.6 | 100.2 | 39.3 | 10.8 | 0.0 | 52.7 | 52.7 | 3.3 | 17.2 | 1.55 | 1.075 |

Table 16. Preliminary Yield Specialty Trial tuber internal defects of colored flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety/Clone | Vascular discoloration | Hollow heart | Internal brown spot | Brown center | Black spot bruise |
|----------------|------------------------|--------------|---------------------|--------------|-------------------|
| | | | ----- % ----- | | |
| Yukon Gold | 0.0 | 0.0 | 30.0 | 0.0 | 0.0 |
| Chieftain | 0.0 | 0.0 | 80.0 | 10.0 | 0.0 |
| Purple Majesty | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| POR16PG7-3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| POR16PG17-2 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| POR16PG25-2 | 0.0 | 0.0 | 0.0 | 0.0 | 20.0 |
| POR16PG34-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| POR16PG42-4 | 40.0 | 40.0 | 40.0 | 0.0 | 20.0 |
| NDOR13293B-1 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| OR11157-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR11157-10 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR13SP198-2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR13SP198-4 | 90.0 | 90.0 | 0.0 | 0.0 | 0.0 |
| OR13SP207-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR14H004-3 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 |
| Mean | 8.7 | 8.7 | 10.7 | 0.7 | 4.0 |

Table 17. Preliminary Yield Specialty Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters.

| Clone | K or D | Description |
|----------------|--------|--------------------------------|
| Yukon Gold | K | |
| Chieftain | K | |
| Purple Majesty | d | pointed, sprouted, heavy skin |
| POR16PG7-3 | K | sprouted |
| POR16PG17-2 | K | scab, smooth |
| POR16PG25-2 | K | nice, smooth |
| POR16PG34-1 | K | chain |
| POR16PG42-4 | K | sprouted |
| NDOR13293B-1 | K | sprouted, pretty |
| OR11157-1 | k | Sprouted, distinctive |
| OR11157-10 | k | |
| OR13SP198-2 | k | good replacement for Chieftain |
| OR13SP198-4 | k | |
| OR13SP207-1 | k | Sprouted |
| OR14H004-3 | k | sticky stolon |

Table 18. Western Region Specialty Trial yield and grade of colored flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Clone/Variety | Total yield | <1¼ inch | U.S. No. 1 | | | | | U.S. No. 2 | Cull | Average tuber weight | No. of tubers /plant | Length/width ratio | Specific gravity |
|-----------------|-------------|----------|----------------------|-----------|------------|-------------|--------|------------|-------|----------------------|----------------------|--------------------|------------------|
| | | | <4 oz | 4 to 6 oz | 6 to 10 oz | 10 to 14 oz | >14 oz | | | | | | |
| | | | ----- cwt/acre ----- | | | | | | | | | | |
| Chieftain | 693.5 | 8.1 | 89.6 | 132.6 | 279.3 | 154.5 | 25.1 | 0.0 | 12.4 | 5.7 | 10.1 | 1.1 | 1.073 |
| Red LaSoda | 787.4 | 10.2 | 56.3 | 79.8 | 194.3 | 206.8 | 228.9 | 3.5 | 17.9 | 7.5 | 8.8 | 1.1 | 1.076 |
| ATTX05175S-1R/Y | 608.3 | 33.6 | 246.6 | 138.3 | 39.0 | 9.7 | 1.6 | 2.1 | 87.8 | 2.4 | 21.3 | 1.2 | 1.075 |
| COTX04193S-2R/Y | 486.1 | 49.8 | 354.7 | 148.1 | 98.8 | 2.2 | 0.0 | 3.6 | 70.5 | 3.4 | 11.9 | 1.1 | 1.078 |
| CO09079-5PW/Y | 420.0 | 16.6 | 213.4 | 46.4 | 10.0 | 9.3 | 3.0 | 0.8 | 12.7 | 1.8 | 19.1 | 1.0 | 1.071 |
| Purple Majesty | 560.9 | 16.9 | 139.6 | 117.0 | 96.2 | 5.6 | 0.0 | 0.0 | 7.1 | 2.9 | 16.0 | 1.2 | 1.084 |
| CO08037-2P/P | 305.2 | 61.5 | 346.4 | 90.6 | 62.2 | 0.0 | 0.0 | 0.5 | 16.6 | 3.1 | 8.1 | 1.2 | 1.062 |
| Yukon Gold | 494.8 | 4.4 | 59.2 | 78.3 | 165.8 | 127.8 | 46.6 | 1.0 | 16.0 | 5.9 | 6.9 | 1.1 | 1.080 |
| CO09128-3W/Y | 389.8 | 63.4 | 249.8 | 12.6 | 1.3 | 0.0 | 0.0 | 0.0 | 126.2 | 1.5 | 21.9 | 1.3 | 1.060 |
| CO09128-5W/Y | 512.5 | 58.1 | 310.2 | 61.2 | 12.9 | 5.0 | 0.0 | 0.0 | 123.2 | 1.9 | 22.6 | 1.0 | 1.078 |
| CO09218-4W/Y | 523.4 | 34.9 | 279.9 | 139.4 | 83.0 | 5.5 | 0.0 | 0.0 | 15.6 | 2.6 | 16.7 | 1.2 | 1.078 |
| LaRatte | 358.8 | 58.5 | 313.7 | 11.5 | 1.6 | 0.0 | 0.0 | 0.0 | 32.1 | 0.8 | 35.5 | 2.5 | 1.072 |
| POR11PG62-3 | 349.4 | 36.3 | 296.3 | 41.1 | 3.5 | 0.0 | 0.0 | 0.0 | 8.5 | 1.7 | 17.1 | 2.3 | 1.078 |
| Mean | 499.3 | 34.8 | 227.4 | 84.4 | 80.6 | 40.5 | 23.5 | 0.9 | 42.1 | 3.2 | 16.6 | 1.3 | 1.074 |
| LSD (0.05) | 100.0 | 11.8 | 57.7 | 34.3 | 34.8 | 30.3 | 28.5 | NS | 36.3 | 0.6 | 3.7 | 0.20 | NS |

Table 19. Western Region Specialty Trial tuber internal defects of colored flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Clone/Variety | Vascular discoloration | Hollow heart | Internal brown spot | Brown center | Black spot bruise |
|-----------------|------------------------|--------------|---------------------|--------------|-------------------|
| ----- % ----- | | | | | |
| Chieftain | 0.0 | 0.0 | 45.0 | 2.5 | 2.5 |
| Red LaSoda | 2.5 | 2.5 | 0.0 | 0.0 | 5.0 |
| ATTX05175S-1R/Y | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 |
| COTX04193S-2R/Y | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| CO09079-5PW/Y | 7.5 | 0.0 | 2.5 | 0.0 | 2.5 |
| Purple Majesty | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 |
| CO08037-2P/P | 0.0 | 0.0 | 2.5 | 0.0 | 0.0 |
| Yukon Gold | 0.0 | 0.0 | 2.5 | 0.0 | 0.0 |
| CO09128-3W/Y | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| CO09128-5W/Y | 0.0 | 0.0 | 5.0 | 0.0 | 5.0 |
| CO09218-4W/Y | 0.0 | 0.0 | 5.0 | 0.0 | 2.5 |
| LaRatte | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 |
| POR11PG62-3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mean | 0.8 | 0.2 | 5.2 | 0.2 | 1.7 |
| LSD (0.05) | NS | NS | 7.1 | NS | NS |

Table 20. Western Region Specialty Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

| Clone/Variety | K or D | Description |
|-----------------|----------|---|
| Chieftain | 3d, k | 3 dull, too big, poor color |
| Red LaSoda | 4D | 2 Irr. Shape, sprouted, 3 lumpy, 2 too big, poor color, 2 dull color, 2 large, misshapen tubers |
| ATTX05175S-1R/Y | 4d | russet skin, 2 sprouted, dull purple, ugly skin, rough skin |
| COTX04193S-2R/Y | 3k, K | dull red, colorful |
| CO09079-5PW/Y | 3k, K | dull red, good color |
| Purple Majesty | 2k, 2d | low yield, low yield vs. Purple Majesty, skin is nice |
| CO08037-2P/P | k, 3d | russeted purple, ugly, dull, dull color, sprouted |
| Yukon Gold | 3k, d | greening, irregular shape, 2 too big, sprouted, skin crack |
| CO09128-3W/Y | 2d, 2D | 4 chain, 2 sprouted, Sprouted, Sticky Stem |
| CO09128-5W/Y | k, d, 2D | 4 Sprouted, growth cracks, Chain |
| CO09218-4W/Y | 2d, 2k | Chain, 3 chain, 3 sprouted, knobs |
| LaRatte | 2d, 2D | 2 sprouted, 2 Sprouted, chain |
| POR11PG62-3 | 4k | knobs, colorful |

Table 21. Oregon Statewide Chip Trial yield and grade, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Total yield | U.S. No. 1 | | | | | U.S. No. 2 | cull | Average tuber weight | No. of tubers /plant | Length/width ratio | Specific gravity | Average fry color, light reflectance | Sugar end |
|-------------|-------------|------------|------------|-----------|-------|-------|------------|------|----------------------|----------------------|--------------------|-------------------|--------------------------------------|-----------|
| | | >10 oz | 6 to 10 oz | 4 to 6 oz | >4 oz | <4 oz | | | | | | | | |
| | | cwt/acre | | | | | | | oz | | | g/cm ³ | % | |
| Atlantic | 639.0 | 234.2 | 236.8 | 85.2 | 66.6 | 17.1 | 0.4 | 15.9 | 6.6 | 8.0 | 1.05 | 1.0927 | 32.9 | 10.0 |
| Snowden | 738.3 | 245.7 | 275.7 | 119.3 | 78.8 | 29.4 | 4.8 | 14.0 | 6.5 | 9.4 | 1.01 | 1.0885 | 32.1 | 2.5 |
| AOR12197-4 | 791.4 | 236.0 | 300.9 | 123.3 | 119.4 | 31.0 | 4.5 | 7.3 | 5.3 | 12.3 | 0.88 | 1.0886 | 32.4 | 5.0 |
| AOR13125-2 | 510.6 | 50.2 | 214.8 | 147.0 | 88.1 | 0.0 | 0.0 | 10.4 | 5.0 | 8.4 | 1.03 | 1.0814 | 34.7 | 7.5 |
| AOR13125-9 | 666.5 | 212.6 | 248.7 | 96.7 | 90.6 | 2.1 | 0.0 | 18.0 | 6.9 | 8.7 | 0.93 | 1.1004 | 32.8 | 5.0 |
| NYOR14Q9-5 | 709.6 | 386.3 | 189.1 | 62.1 | 56.7 | 70.1 | 0.0 | 15.4 | 7.6 | 7.7 | 0.94 | 1.0909 | 36.3 | 0.0 |
| NYOR14Q9-9 | 749.7 | 266.3 | 255.4 | 118.3 | 80.7 | 25.2 | 3.5 | 25.5 | 6.3 | 9.8 | 1.02 | 1.0895 | 34.1 | 5.0 |
| NYOR14Q12-1 | 761.1 | 195.7 | 265.1 | 132.5 | 142.8 | 8.7 | 3.4 | 21.6 | 4.7 | 13.4 | 1.01 | 1.0872 | 32.0 | 7.5 |
| COOR13270-2 | 647.7 | 148.6 | 289.0 | 126.8 | 77.7 | 5.7 | 0.0 | 5.5 | 5.9 | 9.1 | 1.00 | 1.0881 | 32.9 | 5.0 |
| COOR13428-1 | 607.2 | 121.8 | 221.3 | 109.8 | 97.5 | 4.1 | 1.7 | 55.1 | 5.9 | 8.7 | 1.01 | 1.0865 | 35.1 | 0.0 |
| Mean | 682.1 | 209.7 | 249.7 | 112.1 | 89.9 | 19.3 | 1.8 | 18.9 | 6.1 | 9.5 | 0.99 | 1.0894 | 33.5 | 4.8 |
| LSD (0.05) | 125.8 | 94.4 | NS | 30.6 | 30.1 | 21.1 | NS | NS | 1.4 | 2.1 | 0.09 | 0.0084 | NS | NS |

Table 22. Oregon Statewide Chip Trial tuber internal defects for selected clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Vascular discoloration | Hollow heart | Internal brown spot | Brown center | Black spot bruise |
|-------------|------------------------|--------------|---------------------|--------------|-------------------|
| | ----- % ----- | | | | |
| Atlantic | 0.0 | 0.0 | 7.5 | 0.0 | 0.0 |
| Snowden | 2.5 | 0.0 | 0.0 | 2.5 | 0.0 |
| AOR12197-4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13125-2 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 |
| AOR13125-9 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 |
| NYOR14Q9-5 | 0.0 | 0.0 | 5.0 | 0.0 | 5.0 |
| NYOR14Q9-9 | 2.5 | 0.0 | 5.0 | 0.0 | 2.5 |
| NYOR14Q12-1 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 |
| COOR13270-2 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 |
| COOR13428-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mean | 0.5 | 0.0 | 1.8 | 0.3 | 2.8 |
| LSD (0.05) | NS | NS | NS | NS | NS |

Table 23. Preliminary Yield Chip Trial yield and grade, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Total yield | U.S. No. 1 | | | | | U.S. No. 2 | Culls | Average tuber weight | No. of tubers /plant | Length/width ratio | Specific gravity | Average fry color, light reflectance | Sugar end |
|----------------------|-------------|------------|------------|-----------|-------|---------|------------|-------|----------------------|----------------------|--------------------|------------------|--------------------------------------|-----------|
| | | >10 oz | 6 to 10 oz | 4 to 6 oz | <4 oz | >4 inch | | | | | | | | |
| ----- cwt/acre ----- | | | | | | | | | | | | | | |
| Atlantic | 651.2 | 212.1 | 257.6 | 110.5 | 65.9 | 12.4 | 5.1 | 0.0 | 6.6 | 8.2 | 1.03 | 1.096 | 30.1 | 0.0 |
| Snowden | 834.1 | 359.8 | 255.6 | 137.3 | 75.1 | 20.4 | 0.0 | 6.2 | 6.8 | 10.1 | 1.03 | 1.088 | 34.3 | 0.0 |
| NYORQ2-2 | 460.5 | 96.9 | 203.4 | 92.1 | 65.2 | 11.0 | 0.0 | 2.9 | 5.7 | 6.6 | 1.10 | 1.083 | 32.1 | 0.0 |
| NYORQ2-3 | 529.0 | 207.9 | 181.5 | 87.1 | 48.7 | 25.6 | 0.0 | 3.7 | 6.9 | 6.3 | 1.06 | 1.080 | 34.2 | 0.0 |
| NYORQ2-9 | 503.9 | 142.5 | 191.6 | 84.7 | 85.1 | 0.0 | 0.0 | 0.0 | 5.4 | 7.7 | 1.16 | 1.098 | 34.5 | 0.0 |
| NYORQ2-10 | 816.5 | 414.7 | 275.4 | 65.0 | 59.2 | 66.5 | 2.1 | 0.0 | 6.7 | 10.0 | 1.13 | 1.099 | 35.5 | 0.0 |
| NYORQ6-1 | 729.7 | 246.8 | 265.6 | 118.6 | 93.4 | 22.1 | 0.0 | 5.3 | 6.0 | 10.0 | 1.15 | 1.088 | 35.5 | 0.0 |
| NYORQ6-3 | 590.6 | 354.1 | 142.6 | 55.8 | 36.5 | 102.9 | 0.0 | 1.5 | 8.8 | 5.6 | 1.03 | 1.079 | 36.5 | 0.0 |
| NYORQ6-6 | 520.7 | 154.4 | 178.8 | 99.7 | 87.7 | 0.0 | 0.0 | 0.0 | 5.9 | 7.3 | 1.11 | 1.093 | 42.9 | 0.0 |
| NYORN6-8 | 696.2 | 106.7 | 274.5 | 174.8 | 140.3 | 0.0 | 0.0 | 0.0 | 4.9 | 11.7 | 1.06 | 1.077 | 40.0 | 0.0 |
| NYORN18-1 | 376.5 | 146.3 | 133.8 | 55.6 | 36.5 | 18.2 | 2.8 | 1.5 | 6.9 | 4.5 | 1.03 | 1.072 | 38.0 | 0.0 |
| OR13SP225-8 | 682.2 | 110.3 | 260.3 | 155.9 | 148.1 | 5.9 | 0.0 | 7.7 | 4.8 | 11.7 | 1.00 | 1.083 | 32.9 | 0.0 |
| OR13SP225-9 | 363.8 | 3.1 | 101.8 | 142.2 | 108.9 | 0.0 | 0.0 | 7.8 | 4.0 | 7.6 | 1.11 | 1.074 | 36.6 | 0.0 |
| OR13SP225-12 | 600.0 | 168.3 | 249.6 | 100.1 | 74.5 | 6.8 | 7.6 | 0.0 | 6.0 | 8.3 | 1.07 | 1.085 | 33.9 | 0.0 |
| AOR13175-13 | 455.7 | 225.5 | 145.3 | 59.8 | 25.1 | 103.1 | 0.0 | 0.0 | 6.9 | 5.4 | 1.07 | 1.077 | 27.7 | 40.0 |
| Mean | 587.4 | 196.6 | 207.8 | 102.6 | 76.7 | 26.3 | 1.2 | 2.4 | 6.2 | 8.1 | 1.08 | 1.085 | 35.0 | 2.7 |

Table 24. Preliminary Yield Chip Trial tuber internal defects for selected clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018.

| Variety | Vascular discoloration | Hollow heart | Internal brown spot | Brown center | Black spot bruise |
|--------------|------------------------|---------------|---------------------|--------------|-------------------|
| | | ----- % ----- | | | |
| Atlantic | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Snowden | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NYORQ2-2 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| NYORQ2-3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NYORQ2-9 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| NYORQ2-10 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NYORQ6-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NYORQ6-3 | 0.0 | 0.0 | 0.0 | 0.0 | 20.0 |
| NYORQ6-6 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| NYORN6-8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NYORN18-1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OR13SP225-8 | 0.0 | 0.0 | 60.0 | 0.0 | 10.0 |
| OR13SP225-9 | 0.0 | 0.0 | 20.0 | 0.0 | 0.0 |
| OR13SP225-12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| AOR13175-13 | 0.0 | 0.0 | 0.0 | 40.0 | 0.0 |
| Mean | 0.0 | 0.0 | 5.3 | 2.7 | 4.0 |

Table 25. Preliminary Yield Chip Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2018. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lower case letters.

| Variety | K or D | Description |
|--------------|--------|----------------------|
| Atlantic | k | folded bud end |
| Snowden | d | Folded Bud End |
| NYORQ2-2 | k | sprouted |
| NYORQ2-3 | k | |
| NYORQ2-9 | k | |
| NYORQ2-10 | k | |
| NYORQ6-1 | k | |
| NYORQ6-3 | k | |
| NYORQ6-6 | k | |
| NYORN6-8 | k | |
| NYORN18-1 | k | folded bud end, scab |
| OR13SP225-8 | k | |
| OR13SP225-9 | k | |
| OR13SP225-12 | k | |
| AOR13175-13 | k | irregular shape |